Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

TITLE V (DRAFT PERMIT) NO. V-04-008
WICKLIFFE PAPER COMPANY
1724 WESTVACO ROAD P.O. BOX 278
WICKLIFFE, KY 42087-0278
MAY 25, 2006
IL-WON SHIN, REVIEWER

SOURCE I.D. #: 021-007-00002
SOURCE A.I. #: 60
ACTIVITY #: APE20040005

SOURCE DESCRIPTION:

The Wickliffe Paper Company (the Mill or Mill) is owned by NewPage Corporation and is an integrated Kraft pulp and paper mill that produces high-grade coated paper as its primary product. The Mill qualifies as one of the 28 listed 100-ton per year major air emission source categories pursuant to the Kentucky Prevention of Significant Deterioration (PSD) permitting regulation, codified under 401 KAR 52:017. The Mill is located along the Mississippi River at Wickliffe, Kentucky, and it commenced operation in 1970.

The Mill converts hardwood and softwood into wood pulp using the Kraft process. The pulping process begins with either whole logs or purchased chips. Whole logs are brought on-site where they are processed into wood chips. Chips are stored in piles for transport via conveyor belt to the pulping area. Purchased wood-waste and bark from the debarking operations are hogged and stored in piles for combustion in the combination boiler (**Emission Point, EP-09**).

The wood chips are fed into a continuous digester (**EP-05**) along with an aqueous sodium hydroxide (NaOH) and sodium sulfide (Na_2S) cooking solution referred to as "white liquor". The mixture of wood chips and white liquor is subjected to high temperature and pressure in the Kraft cooking process to separate the lignin and wood fiber to produce pulp. During the digestion process, a controlled amount of steam, turpentine, and other gases are vented to a closed system. Turpentine and water are condensed and treated, then sent to the wastewater treatment plant (**EP-66**) by the pulping process condensate collection system (**EP-63**). The wastewater treatment plant is the primary condensate treatment system. The major equipment components in this group include the Evaporator condensates and Pulp Mill condensates.

A steady stream of pulp is discharged from the continuous digester to the blow tank. Non-condensable (odorous) gases (NCG) from the digester system and blow tank are collected for incineration in the Mill's bark boiler. The flash steam from the blow tank is collected in the condenser.

From the blow tank, the pulp is processed through screens prior to being washed. Pulp is washed in the brown stock washing system (**EP-11**) that consists of three countercurrent washers. The pulp and black liquor enter stage one, and hot water is added at stage three. As the pulp passes through the stages of the system, the "weak" black liquor is removed and leaves the system in stage one, and is

sent to the black liquor recovery system. The hot water is added in the third stage and flows countercurrent to the pulp until it reaches the first stage. The washed pulp is pumped from the third stage of the washer system to the pre-bleach stage, and then to the first stage of the bleach plant (**EP-51**). The weak black liquor from the pulp mill contains mostly water that must be removed before the liquor can be burned in the recovery furnace (**EP-03**). The multiple effect evaporators (**EP-6**) remove most of the water from the liquor prior to firing in the chemical recovery furnace.

The black liquor solids in the concentrated black liquor produced by the evaporators are burned in the recovery furnace to reclaim cooking chemicals and produce steam and heat for other processes at the Mill. The recovery furnace is a direct contact evaporator (DCE) design, meaning that the flue gases directly contact the incoming black liquor in the concentrator. The molten inorganic ash from the recovery furnace, called smelt, is discharged from the furnace into a smelt tank (**EP-04**) and is recycled using water to make green liquor.

The green liquor is sent to the lime slaker, where reburned lime from the lime kiln (**EP-08**) is added to begin the causticizing reaction. Grits, raked from the slakers, are washed and landfilled. The white liquor slurry from the slaker passes through three causticizers, which provide the residence time for the causticizing reaction to complete, producing white liquor. This stream then flows to the white liquor clarifier, which serves to separate white liquor for the lime mud (precipitated $CaCO_3$). White liquor from the clarifier is sent to storage until it is utilized in the digesters. The lime mud is calcined in the lime kiln to recycle the lime (CaO) for reuse in the causticizing process. The lime kiln will be fired with natural gas and petroleum coke (pet coke), and also serves as a back-up NCG incineration point should the Mill's bark boiler be out of service for any reason.

The Wickliffe Paper Company has proposed to supplement natural gas fuel firing in the lime kiln with an equivalent heat input derived from pet coke combustion. Based on the Mill's goal to fire pet coke as an economic alternative to natural gas, the following critical path items were taken into account as part of this project permitting feasibility analysis:

- Replace natural gas with pet coke for up 75% of the heat input to the lime kiln on an annual basis. Natural gas will still be used to fire the kiln for the balance of the heat input.
- Maintain the short-term and annual heat input capacity of the lime kiln achieved over the past 5 years.
- Commence pet coke firing in the lime kiln by the middle of 2006.

The operating permit application was received on October 24, 2005. This project was incorporated into the Title V permit.

Pulp from the brown stock washing system is pumped to the bleach plant where it is whitened with a chlorine dioxide (ClO_2) based bleaching solution. Bleached pulp is then pumped to either the paper machine (**EP-64**) and made into paper or to the pulp dryer (**EP-40, EP-41**) and dried as market pulp. The paper machine dewaters the incoming pulp slurry and then uses steam drums to dry the paper web to the proper moisture level. Coating is applied in the off-machine coating area. The coater (**EP-52**) is equipped with natural gas fired infra-red (IR) and air flotation dryers that are used to dry the coated paper. The finished sheet is wound on large reels that are trimmed and rewound into smaller customer ordered sizes. Finishing and loading of the completed rolls is the final step in the process.

The Mill's finished paper products are fine coated and uncoated papers that are primarily used by the printing and publication industry. At the pulp dryer, the pulp slurry is dewatered, pressed, flash-dried with natural gas fired dryers, and then baled for shipment to customers.

In addition to the main pulp and papermaking processes, the Mill operates ancillary processes to support the production operations. These ancillary processes include utilities to produce steam and a wastewater treatment facility. Process wastewater generated by the Mill is treated biologically in an aerated stabilization system before it is discharged to the initial stage of treatment by removing most of the settleable solids and floating scum. Nitrogen and phosphorus are added as needed to the wastewater prior to the aeration basins to provide nutrients to the microorganisms that degrade the Biological Oxygen Demand (BOD) to carbon dioxide and water. Air is supplied in the aeration basins to complete the degradation process. Effluent from the aeration basins flows into a secondary clarification basin for final settling prior to discharge to the river. The sludge is removed from the clarifier and dewatered using a screw press. The dewatered sludge is either burned in the combination boiler or placed in an on-site landfill.

Starch silos (**EP-14, EP-19**) are used to store starch that is pneumatically unloaded from railcars or trucks prior to use at the paper machine. A clay silo (**EP-20**) and starch silo (**EP-38**), respectively, are used to store materials, which are used to produce the final coated paper product. The petcoke storage silo (**EP-69**) is used to store petcoke that is pneumatically unloaded from trucks prior to use at lime kiln. Each silo is equipped with loading and unloading equipment, and is controlled by a baghouse on each silo. A gasoline storage tank (**EP-55**) is used to store gasoline that is used by mill vehicles. A methanol storage tank (**EP-67**) is used to store this raw material that is used in the manufacture of chlorine dioxide.

Mill utilities include three boilers to produce steam for mill operations and comfort heating. Two of the boilers (**EP-01, EP-02**) are package units that are permitted to fire natural gas. The bark boiler (primary mill boiler) is a multi-fuel boiler and fires bark, wood waste, on-site generated wastewater treatment plant sludge, paper, fiber waste, waste oil, natural gas, and tire derived fuel (TDF). The unit controls air pollution emissions by an electro-static precipitator (ESP). The bark boiler also serves as the primary NCG incineration point. NCGs from the digester blow tank, turpentine condenser, multiple-effect evaporators, brown stock filtrate tanks, and brown stock washers are combusted in the bark boiler.

The construction permit application to fire TDF for a Trial Test Period was received on January 30, 2004 and logged complete on June 8, 2004. The construction permit authorizes the Mill to fire TDF in the combination boiler. A proposed federal permit was issued on April 29, 2005. In addition, the application for TDF continuous burn was received on February 16, 2006. This project was incorporated into the Title V permit.

TDF primarily replaces natural gas firing; however, the mill needs to retain the ability to fire limited amounts of natural gas. Firing TDF in the Bark Boiler instead of natural gas has significant economic and environmental advantages. The primary advantages of firing TDF are that it: (1) is more cost effective, (2) eliminates scrap tires, (3) conserves natural resources and fossil fuel, and (4) typically burns cleaner than other potential alternative fuels considered.

TDF is delivered to the mill via truck. Existing bark storage areas are utilized to temporarily store the TDF prior to introduction to the boiler. Based on the current mill practices for handling, storing and feeding solid fuels such as TDF to the boiler; any fugitive emissions associated with the process is negligible. The Mill is able to use the existing fuel delivery system for bark as a means to feed TDF to the boiler. No physical or operational changes are required to the boiler to accommodate TDF as a new fuel.

The Wickliffe Paper Company has proposed to fire High Volume Low Concentration (HVLC) gases from the brown stock washers in the bark boiler using lime kiln as a backup control device. The brown stock washers HVLC gases to the bark boiler or lime kiln is necessary to meet the Hazardous Air Pollutant (HAP) reduction requirements of the National Emissions Standards for Hazardous Air Pollutants (NESHAP) from the Pulp and Paper Industry which is codified in 40 CFR 63, Subpart S and is also referred to as the Pulp and Paper MACT (MACT I, Phase II). MACT I, Phase II requires that the Mill collect and combust prior to April 17, 2006. Brown stock washer HAPs are comprised of several constituents, although methanol is the single largest constituent. As a result, 40 CFR 63, Subpart S targets methanol as the surrogate for all HAPs from pulp washing systems. The operating permit application was received on May 26, 2005. This project was incorporated into the Title V permit.

A previous issued PSD permit, VF-01-002, allowed the Mill to increase processing rates for most units. An alternate operating scenario (AOS) was included for

- Digester System (EP-05)
- Recovery Furnace (EP-03)
- Lime Kiln (EP-08)
- BLOX Towers (EP-07)

The increased production from these units has not occurred and the AOS has not been included in the Title V permit. Additionally, the unit 00, Entire Mill, is not an emission unit and is not included in the Title V permit. Existing PSD limits on specific units are included under each unit, as applicable, in Section B of the Title V permit.

COMMENTS:

As of January 13, 2003, Westvaco Kentucky, L.P., became MeadWestvaco Kentucky, L.P. As of April 15, 2005, MeadWestvaco Kentucky, L.P., became Wickliffe Paper Company, a company owned by the NewPage Corporation. Significant emission units are listed below. Table 1 details processes and operations at the Mill, and lists the air pollution control devices and its respective efficiency. Process facilities with no air pollution equipment are also identified. For additional information for each respective emission point refer to Section B or Sections E of the Title V operating permit.

Table 1, Pulp and Paper Process Units

Process unit	Process description	Control device	Control device	Construction date	Comments	EP- #

			efficiency			
Power Boiler #1	Heat	None	None	July 1970	MACT	01
Power Boiler #2	Heat	None	None	July 1970	MACT	02
Recovery Furnace	Heat & chemical recovery	ESP/wet scrubber	99.5 % (PM/PM_{10}, SO_2)	July 1970	MACT	03
Smelt Dissolving Tank	Chemical conversion	Wet scrubber	98.5 % (PM/PM_{10})	July 1970	MACT	04
Digester & Blow tank	Digest wood chips to pulp	NCG into Bark Boiler (EP-09) or Lime Kiln (EP-08)	99.4 % (TRS, H_2S)	July 1970	BACT/MACT	05
Multiple Effect Evaporator System	Chemical recovery	NCG into Bark Boiler (EP-09) or Lime Kiln (EP-08)	99.4 % (H_2S)	July 1970	BACT/MACT	06
BLOX Towers	Oxidize TRS	None	None	July 1970		07
Lime Kiln	Chemical conversion & control	Wet scrubber	99 % (PM/PM_{10})	July 1970	MACT	08
		NCG combustion	99.5 % (H_2S, SO_2, TRS)			
Combination Boiler	Heat & control	ESP	99.5 % (PM/PM_{10})	July 1979	BACT/MACT	09
		NCG combustion	99.6 % (H_2S, TRS) 75 % (SO_2)			
Brown Stock Washer: Knot System, Decker, Primary and Secondary Screen Reject Tanks	Wash pulp	None	None	July 1970	MACT	11
No1&2. Brownstock Washer No1&2. Filtrate Tank Decker Filtrate Tank Pre-Bleach Filtrate Tank		NCG into Bark Boiler (EP-09) or Lime Kiln (EP-08)				
Starch Storage Silo	Storage & unloading	Baghouse	98 % (PM/PM_{10})	July 1970		14
Starch Storage Silo	Storage & unloading	Baghouse	98 or 99.9 % (PM/PM_{10})	August 1989		19, 38
Clay Storage Silo	Storage & unloading	Baghouse	99.9 % (PM/PM_{10})	August 1989		20
Pulp Dryer Line1	Dry pulp	Wet Scrubber (series)	95 % (PM/PM_{10})	July 1970		40
Pulp Dryer Line2	Dry pulp	Wet Scrubber (series)	95 % (PM/PM_{10})	July 1970		41

Bleaching System: Chlorine dioxide generator Chlorine dioxide storage tank Bleach line towers (3) Bleach line filtrate tanks (4) Bleach line washers (4) Vent gas scrubber	Bleach pulp	Wet Scrubber	99 % (Cl/ClO_2)	July 1970 Modified 1996	MACT	51
Coater Complex: Six (6) IR Dryers (Stacks 21-26) Six (6) TEC Convection Dryers (Stacks 27-32) Ammonium Hydroxide tank (stack 33) Latex tank (stack 34) Plastic Pigment tank (stack 35) Latex tank (stack 36) PVA tank (stack 37)	Coat & dry coated paper	None	None	August 1989	MACT	52
Gasoline Storage Tank (3,000 gals)	Company Gasoline Storage tank	None	None	1972		55
HVLC System: No. 1 Brownstock Washer Hood No. 2 Brownstock Washer Hood No. 1 Filtrate Tank No. 2 Filtrate Tank Blow Tank Condenser Vent Condensate Collection Tanks	To convey HVLC gases into Bark Boiler (EP-09) or Lime Kiln (EP-08)	None	None	1997	MACT	56
LVHC System: Evaporators	To convey LVHC gases into Bark Boiler (EP-	None	None	1994	MACT	57

Turpentine condenser Digester System	09) or Lime Kiln (EP-08)					
Pulping Process Condensate Collection and Treatment System: Evaporator condensate Pulp Mill condensates	To convey pulping process condensates to the wastewater treatment plant	None	None	November 2000	MACT	63
Paper Machine System	Includes all paper machine process equipment	None	None	July 1970	MACT	64
Wastewater Treatment System	Wastewater treatment	Primary/Secondary Treatment	99.9 % (VOC)	1976	MACT	66
Methanol Storage Tank(s)	Feed stock for chlorine dioxide generator	Nitrogen Pad	99 %	1996		67
PetCoke Storage Silo	Store petcoke	Baghouse	99 % (PM/PM_{10})	2006		69

* BACT (Best Available Control Technology), ESP (Electro-Static Preceptor), MACT (Maximum Achievable Control Technology), NCG (Non-Condensable gas), TRS (Total Reduced Sulfur)

Annual and hourly air pollutant emissions are based on company stack test data, USEPA AP-42 information, material balance, NCASI reference material, USEPA Clearinghouse for BACT, or consultant/vendor information. Annual air pollutant emissions are based on any consecutive 12-month rolling average.

The following applications, registrations, or notices have been combined with this Title V operating permit application, **V-04-008**. This initial Title V operating permit application was received on December 14, 1999 and logged complete on February 12, 2000.

PERMIT NUMBER	SUBJECT, PROCESS OR FACILITY
S-96-111	ECF CHLORINE REPLACEMENT
O-84-88	GENERAL OPERATING PERMIT
C-89-148	BARK BOILER (OIL FIRING)
C-92-090	PULP DRYER

S-97-074	FOUR STAGE BROWN STOCK WASHING
C-89-033	COATER
S-94-087	NCG SYSTEM
C-84-85	DIGESTER RELIEF/BLOW TANK RELIEF AND 6 EFFECT EVAPORATOR
C-83-206	REPLACEMENT OF SMELT TANK MIST ELIMINATORS
F-99-009	CHIP METERING SYSTEM DEBOTTLENECKING
S-01-010	DIGESTER EXTRACTION SCREENS
VF-01-006	RECOVERY FURNACE ECONOMIZER/SUPERHEATER
VF-01-002	MILL-WIDE PSD CONSTRUCTION PROJECTS
VF-04-002	BURN TIRE DERIVED FUEL (TDF) IN BARK BOILER
Receive application on May 26, 2005	FIRE HVLC GASES IN BARK BOILER OR LIME KILN
Receive application on October 14, 2005	PETROLEUM COKE FUEL SUBSTITUTION IN LIME KILN
Receive application on February 10, 2006	TDF CONTINUOUS BURN IN BARK BOILER

NO_x Budget:

Power Boilers 1 and 2 each have capacities greater than 250 mmBtu/hr and are subject to the NOx budget permitting process. These two boilers use natural gas as the fuel source, and are used to provide part of the steam load at the Mill. The NO_x budget application for these boilers was received by the Division on October 24, 2002.

The Title V operating permit requires that by no later than November 30 of each year, the owner or operator shall hold NO_x allowances available for compliance deductions in the unit's compliance account in an amount not less than the total NO_x emissions for the control period from the unit. To demonstrate compliance, the Mill will submit to the Division and the USEPA Regions IV administrator, a compliance certification report for all affected units. Each year that the NO_x budget source, the Mill, elects to monitor NO_x emissions from the boiler using a Low Mass Emission Unit (LMEU) methodology, the Mill is required to submit a demonstration showing that the boiler continues to emit no more than 50 tons of NO_x per ozone season. The emission limits listed under the Title V operating permit specifies that the NO_x budget limit per boiler shall not exceed 50 TPY for a given ozone season. The permittee is required to monitor the NO_x emissions, and from that calculate and demonstrate that NO_x emissions for this demonstration are below budget limits. Refer

to Sections B.2 and B.4 of the Title V operating permit. Should any LMEU fail to provide the required demonstration, such that the calculated cumulative emissions for the unit exceed 50 tons of NO_x at the end of any ozone season, then:

i. The LMEU shall be disqualified from using the low mass emissions excepted methodology; and

ii. The owner or operator of the LMEU shall install and certify monitoring systems that meet the requirements of 40 CFR Part 75.10 by December 31 of the calendar year following the ozone season in which the unit exceeded 50 tons NO_x.

Applicable Regulations:

Please refer to the respective Section B of the permit for the regulations that are applicable.

Regulations Not Applicable:

Please refer to the respective Section B of the permit for the regulations that are not applicable.

EMISSION AND OPERATING CAPS DESCRIPTION:

Please refer to Sections B.1 and B.2 in the Title V operating permit for the operating and emission limits per each process unit at the Mill.

PERIODIC MONITORING:

Section B of the Title V operating permit for each respective emission point lists the means of demonstrating compliance which may include periodic monitoring as a requirement. General Requirements of the Title V operating permit for the Mill specifies the reporting requirements for periodic monitoring.

OPERATIONAL FLEXIBILITY:

None

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.